The effect of temporary employment subsidies on employment duration

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Abstract

In this paper we estimate the impact of temporary employment subsidies for young long-term unemployed workers in Belgium on the transition rate from *employment to non-employment*. We account for selective participation on the basis of a multivariate duration model with correlated unobserved heterogeneity. Our estimates indicate that the policy decreases the transition rate from employment to non-employment in the first year of participation. There is no significant effect on the transition rates in the second year and after participation.

Keywords: evaluation, subsidised employment, MMPH, employment duration
JEL-Classification: J64, J68, C41, H43

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1 Introduction

Most member states of the European Union have experienced high unemployment rates for a long time and spend a considerable share of their GDP on active labour market policies (OECD (2004)).[1]

In this paper we estimate the effect of participation in a Belgian active labour market program (ALMP) in the form of a temporary employment subsidy. The subsidy provides a reduction in social insurance contributions to employers when recruiting eligible long-term unemployed workers. Our analysis focuses on young unemployed workers. The particularly high unemployment rates for this group motivates this choice.[2] We estimate the effect of program-participation on the employment duration, during and after the temporary subsidy.

We find that subsidised employment decreases the transition rate from employment to non-employment in the first year of participation. We don't find significant effects on the transition rates in the second year and after the end of the subsidies.

Although an empirical implementation of a theoretical model is beyond the scope of this paper it might be useful for the interpretation of our results to take a look at the theoretical literature. Despite the fact that economists have advocated employment subsidies for a long time,[3] there are only few theoretical models which provide analytical results concerning the effect of employment subsidies on labour market flows.

One exception is Mortensen and Pissarides (2003) who deliver insight into the effect of different types of subsidies on job creation and job destruction by integrating subsidies in a search and matching equilibrium framework with endogenous job-destruction.[4] In their analysis they distinguish between two types of subsidies. *Hiring subsidies* paid once, at the start of an employment spell and *employment subsidies* which provide a flow

[1] See Martin and Grubb (2001) for a review of different active labour market policies.

[2] Eurostat (2006) reports that the annual harmonised unemployment rate for people younger than 25 years was 18.5 % in 2005 for the European Union (EU-25) compared to 8.7 % for the whole labour force. The reported statistics are based on the European Union Labour Force Survey.

[3] See Kaldor (1936) for an early paper which analyses employment subsidies. Phelps (1994) and Snower (1994) are recent examples.

[4] Their framework is similar to Mortensen and Pissarides (1994) where job destruction is modelled by random productivity shocks which lead to destruction when the productivity of a job falls below a match specific reservation value. Mortensen and Pissarides (2003) underline the importance of the free entry condition for their results and refer to a paper of Davidson and Woodbury (1995), who fix the total number of job in a related framework.

of subsidies during the job duration. Their main findings can be summarised as follows: hiring subsidies lead to shorter unemployment durations but increase unemployment incidence and consequently lead to a higher turnover on the labour market.[5] In contrast, employment subsidies lead to a steady state that is characterised by a lower reservation productivity. This translates into an increase of the expected employment duration.[6] A temporary employment subsidy shares features with both the hiring and the employment subsidies. We will come back to this model in section 5, where we present our results. For now, we can state that Mortensen and Pissarides (2003) show that employment subsidies potentially affect employment duration.

Despite the widespread use of subsidised employment programs and ongoing efforts to evaluate them, the picture which is provided by the evaluation literature is mixed. Martin and Grubb (2001) and Dar and Tzannatos (1999) give an account of the ambiguity in the estimated effects.

The recent microeconometric evaluation literature has mainly focused on two different outcomes.[7] A first branch of research looks at the probability of being un/employed (e.g. Caliendo et al. (2005), Gerfin et al. (2005)). Others focus on the transition rates out of unemployment (e.g. Lubjova and van Ours (1999), Fredriksson and Johansson (2004), Forslund et al. (2004), Göbel (2006)). In these studies the time in subsidised employment is commonly regarded as time in unemployment. In contrast to this literature we consider the time in subsidised employment as time in employment. At first sight our approach seems to be optimistic, since generally the aim of participation in labour market programs is the integration into employment and not program-participation itself. However, in the case of subsidised employment program participants can be considered as employed. If it is the aim of the subsidy program to integrate program-participants into employment then the effect of participation on the duration of the first employment is a natural candidate for an evaluation analysis. In this paper we focus on the effect of the subsidies on the duration of the first employment. We contrast the duration of

[5] A hiring subsidy stimulates job creation, however once a job is created the opportunity cost of maintaining the match rises since the hiring subsidy can again be obtained when creating a new job.

[6] A longer expected life of a new job implies also that the "desired job creation" increases" and "with it market tightness"(Mortensen and Pissarides (2003)).

[7] Macroeconomic evaluation has many desirable features but cannot be applied in our case because of the small program-size.

employment that starts by a subsidised employment to what would have happened if the workers had a direct transition to regular, non-subsidised employment instead. In our paper, program participation as well as the counterfactual situation are considered as employment.

It is a problem of microeconometric evaluation studies of subsidised employment programmes that some of the created jobs would also be created in the absence of the program (Martin and Grubb (2001)). Our study is less vulnerable to this problem, since the counterfactual situation is a hypothetical transition into regular employment. Consequently our analysis, which focuses on the employment duration, is valid when the participant would have had a transition to employment without the subsidy as well.

Despite the high unemployment rates for young workers only few recent studies have analysed the effect of participation in subsidised employment for this group. Carling and Larsson (2005) and Larsson (2003) investigate Swedish programs and do not find long term effects on the probability of being in employment after participation in subsidised employment. Analysing different youth programs in France Brodaty et al. (2001) find that regular fixed term employment has stronger ex-post effects on the probability of being employed with a long term contract than various subsidised employment programs. Blundell et al. (2004) evaluate the New-Deal in Great Britain and find an important impact on the transitions out of unemployment for a combination of intensive job-search assistance and subsequent subsidised employment. Our study provides new evidence for subsidised employment for young workers.

In most European programs the subsidies are provided to the employer. This is different from programs in the US or Canada which often provide incentives on the supply-side of the labour market.[8] If the subsidy is provided to employers who decide how many subsidised workers they hire we cannot a priori assume that the "participating" employers are comparable to the non-participating ones. Indeed they might have particular labour market characteristics. In addition to the usual selection problem for the participating workers we might face a selection problem on the employer side as well. To estimate the effect of subsidised employment we have to control for this "double-

[8]See Eissa and Liebman (1996), Meyer and Rosenbaum (2001) or Hotz et al. (2005) for recent studies on the US Income Tax Credit program and Card and Hyslop (2005) for the Canadian Self-sufficiency experiment. See also Meyer (1995) who evaluates different US job-search bonus experiments.

selection". Therefore we include a large set of explanatory variables which reflect the characteristics of the workers and employers.

We use an administrative database with matched employer-employee data for our analysis. The database allows us to construct the labour market histories of Belgian school leavers. We implement a multivariate competing risk duration model (Abbring and van den Berg (2003a)). This framework has the advantage that we can test whether our results are robust with respect to selection in unobserved characteristics of the workers.

The paper is structured as follows. Section 2 provides a description of the policy-measure we have evaluated. Section 3 gives a short description of the used database. In section 4 we develop the econometric model which allows an evaluation of the reduction of social insurance contributions. Section 5 provides the key result of the estimation and section 6 concludes.

2 The Belgian "Recruitment Plan"

Before we start with the description of the policy, note that, in Belgium, young people are particularly concerned by high unemployment rates: 21.5% compared to 8.4% for the whole labour force in 2005 (Eurostat (2006)). The Belgian unemployment insurance system provides unemployment benefits to all involuntary unemployed people who have sufficiently contributed before (OECD (2001)). Different from most other countries unemployment benefits are even payed to school leavers without work experience after a waiting period. For the young school leavers considered in this paper the waiting period is 9 months. There is no general benefit exhaustion and unemployed people can receive benefits for an unlimited time.[9] The amount of the benefits depends on the family type and employment record. For school leavers a flat-rate is applied. In the year 2000 this flat-rate varied between €307/month for cohabitants who are not in charge of family and €790/month for cohabitants who are in charge of family (ONEM (2000)). There exist several labour market programmes which try to integrate school leavers into

[9] See Cockx and Ries (2004) for a detailed description of benefit exhaustion in Belgium.

employment.[10]

In this paper we analyse the effect of an employment subsidy program. The program is called the "Recruitment Plan" and provides subsidies in the form of a reduction in social insurance contributions on the employer's side, under certain conditions. Since we limit our analysis to young long-term unemployed people, we restrict our description to this group.[11]

Employers who want to hire workers under the terms of the Recruitment Plan have to pay social insurance contributions. Only employers from the private sector are eligible.[12] Employers who benefit from the Recruitment Plan are not allowed to benefit from other reductions in social insurance contributions for the same worker at the same time.

Young *workers* have to be unemployed for at least 12 months "without interruption", in order to be entitled to the Recruitment Plan. A period of unemployment is considered to be "without interruption" when the periods in which the unemployed worker does not receive unemployment benefits are not longer than four months.[13]

The *subsidy* is provided when hiring an entitled unemployed worker. The labour contract must be at least for half-time employment. Roughly speaking the subsidy follows a two year scheme. In the quarter of hiring and the four subsequent quarters the reduction is 75% of the base amount of social insurance contributions; from the fifth to the eighth quarter it is 50%.[14] This implies a subsidy amount of roughly 25% of the gross wage in the first year and 17% of the gross wage in the second year. The Recruitment Plan ends after the eighth quarter.

There is no automatic or external *assignment* to the program and there is no information about how a worker or an employer actually gets assigned. The absence of automatic assignment is important for the identification of the estimated effects since it ensures the existence of workers who have a flow into regular employment.

[10]For a detailed descriptions of the different programs we refer to the yearly reports of the national employment office, e.g. ONEM (2000).

[11]The Recruitment Plan is not limited to *young* workers. Also older long-term unemployed workers can participate in this program.

[12]The following institutions are excluded from the Recruitment Plan: the Belgium state, the three language-communities, the regions and related institutions.

[13]For school leavers also the time in the 9 months waiting period is counted as unemployment.

[14]The Recruitment Plan provides slightly higher subsidies (100%/75%) for workers who have been in unemployment for more than 24 months. To ensure that we have a clearly defined subsidy program we exclude participants with more than 24 months of unemployment and we focus on the subsidies which are provided for workers who have been in unemployment between 12 and 24 months.

We will see in the next section that despite the relative importance of the reduction in labour costs only a small fraction of the eligible workers actually participates in the program. This points directly to a problem in the implementation of the Recruitment Plan. Although the law which defines the eligibility rules and the financial advantages of the program has been published, the program has never been promoted by the unemployment offices or the social offices on a large scale. Even though the low take-up rate is puzzling at first sight, it basically reflects that neither the employers nor the unemployed workers have been informed about the availability of this measure in a systematic way.[15]

3 Description of the database

Our dataset has been provided by the Belgian "Crossroads Bank for Social Security" and contains information about young workers. The database combines administrative data from different institutions of the Belgian social security system.[16] Since the database contains information about unemployment, employment, self-employment and inactivity (identified by absence in the other databases) we are able to determine individual labour market histories on a quarterly basis. The observation period is from 1998 to 2000. In addition we have aggregate information about the workers for the period before 1998. However we cannot observe the complete individual labour market histories for the pre-1998 period. This may lead to initial condition problems: preceding labour market histories are known to have an impact on labour market outcomes. Therefore, ignoring what happened before the start of the observation period might lead to spurious results in our analysis. To avoid this problem we choose workers without observed employment experience.

One starting point for our analysis of young unemployed workers without employment experience would be to consider their individual labour market history from the start of unemployment at the end of school. Unfortunately we cannot observe the flow into unemployment directly after school in our database. Instead we sample the flow in

[15] Also the simultaneous existence of different labour market programs for young workers may play a role for the explanation for the low participation rates. However there was no more generous program at that time, nor had the employers or workers any disadvantage by participating.

[16] The data is from the National Office for Social Security (ONSS), National Employment Office (ONEM), National office for family benefits for salaried persons (ONAFTS), Social insurance institute for self-employed workers (INASTI) and the National Institute of Statistics (INS).

paid-unemployment at the end of the 9 months waiting period.[17] This sample is homogeneous with respect to the labour market history in the sense that we retain workers without employment spells before they enter paid-unemployment. We use a sample of workers who are between 18 and 26 years old when they start their waiting period. Applying these criteria we get a flow-sample of 16.376 workers who enter paid-unemployment in 1998, after their waiting period. For the estimation we have to delete further observations either because of missing data or contradictory values. Finally we keep a database with 15.217 workers, 8.720 women and 6.497 men.

For a complete description of the variables in our database we refer to table 1 in the appendix. In this section we limit our description to the subgroup of workers who *participate* in the Recruitment Plan and the *control* group. The control group consists of workers who have a direct transition from unemployment to regular employment. We define regular employment as employment which starts without participation in an active labour market policy. The number of young workers who participate in the Recruitment Plan is relative small compared to the number of those who have a transition to regular employment. We have 257 (246) women (men) who participate in subsidised employment compared to 3.156 (2.776) in the control group. The remaining 60.8% (53.5%) of the female (male) workers have either no transition to employment during the observation period or a transition into inactivity or another ALMP.

First we take a look at the *individual characteristics*. The average age at the end of 1997 is around 20.5 years for both subgroups. The group of women (men) who have a transition from unemployment to regular employment contain a slightly higher fraction of Belgians 91.4% (89.4%) than the subgroup of participants 87.9% (88.6%). For women who have a transition to regular employment we observe a larger proportion of college degrees, 26.9% compared to 20.6% for participants.

The month of entry into paid-unemployment corresponds to the month in which the waiting period is finished and full unemployment benefits are paid. Note that for workers who finish compulsory-school education in June the waiting period starts the first of August, if they are enrolled as job-seekers.[18] These workers enter paid-unemployment in

[17] In the following, we refer to paid-unemployment for unemployment with unemployment benefits i.e. unemployment after the waiting period.

[18] The time between the end of the school-year and the 1st of August are not considered for the waiting

April of the year after the enrolment. We can see that an important fraction (around 30%) of the workers enter paid-unemployment in April. Since a considerable amount of students start their waiting period in July, September or October there is also an important fraction of workers who enter paid-unemployment in March, May or June: 40.5% of the women and 42.4% of the men. There are two main explanations why workers may enter in other months - either they have not enrolled as job-seekers immediately after leaving school or they have not left the school-system at the end of a school year.[19]

Our database also contains information about *characteristics of the workers household*. The largest fraction of workers is reported to be child of the head of the household: More than 72% (84%) of the women (men). This is a consequence of restricting our analysis to school-leavers. The remaining workers are either head of the household, spouse of the head of the household or living in the household without a family relationship to the head of the household. For each household we distinguish between the number of children in the age class (0-3] and (3-12]. For details we refer to table 1. On average there are 2.7 (2.8) persons living in a household for women (men).

Two variables describe the *labour market conditions*. First, the unemployment rate at the level of the local unemployment office.[20] At the start of the observation period, the unemployment rates for women are considerably higher than for men: 25.7% for the unemployed women who have a transition to regular employment and 27.6% for women who participate in subsidised employment in contrast to 17.8% and 19.6% for the respective groups of men.

The database provides information about the region where the workers live. Around two thirds of the workers came from the southern, French speaking, Walloon, region of Belgium. The labour market conditions in the northern, Flemish, region are more favourable. This leads to less long-term unemployment and consequently the number of participants from the Flemish region is relatively low.

When it comes to the characteristics of the *employer* we observe significant differences

period by the unemployment office. An exception is made for young workers who abandon school before the end of the courses (ONEM (2005)).

[19] In Belgium schooling and studies are structured in school years or academic years.

[20] There are 30 local unemployment offices in Belgium. The unemployment rate is defined as the number of people who receive full unemployment benefits as a percentage of those who are covered by unemployment insurance (ONEM (1998)). This is an administrative measure which is different from the definition of the International Labour Organisation.

between regular and subsidised employment. Again, we refer to table 1 for the complete picture. The sector of the employer is identified by the NACE-code which is available at the two-digit level. To make the sector information processable we keep only the 8 largest sectors at the two-digit level and regroup the remaining sectors at the one-digit level. The sectors on the two-digit level cover almost 75% of the employment spells in our data-base.[21] Furthermore we have a variable which indicates if the employer is a local public administration (APL) which cannot profit from the Recruitment Plan. A small fraction of the workers in regular employment is registered as self-employed. The companies who hire subsidised workers are on average smaller than the companies of the regular employed workers.

To summarise, we can state that the descriptive statistics of the observed individual characteristics and of the local labour market for participants and their control group are similar. However, the observed characteristics of the *employer* for the two subgroups are significantly different.

Before we describe the *survival rates*, note that the duration in unemployment is measured after the end of the 9-months waiting period. Figure 1 shows that the non-parametric survival rate in unemployment is always higher for women than for men.[22] The median duration in unemployment for women is thus longer than that for men, 16 vs. 13 months.

In figure 2 and 3 we compare the survival rates in employment for participants and non-participants. For male as well as for female workers the survival rates in employment diverge during the first 12 months after the quarter of the transition into employment. The survival rates after 12 months is 8.9% (12.4%) higher for the participating women (men) compared to the workers who start employment without participation. This indicates that the average transition rate from employment to non-employment are lower for the participants at the start of employment. As from the 12th month the survival rates converge and 30 months after the quarter of entry into employment the survival rate for female (male) participants are only 5.7% (3.1%) above the survival rates for non-participants. To summarise the survival rates in employment suggest that the participants have a lower transition rate out of employment in the first year and a higher

[21] At the two-digit level we retain food and beverage manufacturing, construction, retail trade, hotels and restaurants, other business activities, public administration, education and health-sector.

[22] See Lancaster (1990) for the estimation of non-parametric survival functions.

transition rate out of employment after the first year.[23] It is also remarkable that the survival rates in employment decline fast. One year after the quarter of the transition into employment almost 50% of the non-participating workers had a transition from employment to non-employment.

Transition rates are informative about how the labour market flows evolve over time. Figure 4 shows that the transition rate from unemployment to regular employment displays a negative time dependence, defined by a transition rate which is decreasing over time. However, it is well known that disregarding the heterogeneity of the workers leads to spurious time-dependence (Lancaster (1990)). Controlling for the observed characteristics of the workers the negative time-dependency is less pronounced. From figure 5 we can see that most of the transitions from unemployment to subsidised employment are within the first year after the workers get eligible.[24] The decrease in the transition rate after the 15th month in paid-unemployment can be explained by the availability of slightly higher subsidies thereafter.[25] Figure 6 shows that we also have negative time dependence for the transitions from employment to non-employment.

4 Econometric Model

We model the labour market trajectories of young long-term unemployed workers from the moment they enter paid-unemployment until they leave their first employment spell. Figure 7 illustrates the transitions between the different labour market states considered in our empirical model. At the beginning all workers are in unemployment. They can have two competing transitions: either the workers have a transition to subsidised employment or they have a transition to regular employment. Once the workers are in employment (either regular or subsidised) the only possible transition is to non-employment. Our main interest is in the right hand side of figure 7, i.e. the causal effect of subsidies on the transition rate from employment to non-employment.

To capture the dynamic nature of the effects we explicitly allow them to vary over

[23] For the moment we ignore the characteristics of the participants and non-participants.

[24] Recall that the workers get eligible after 12 months of unemployment, including the 9 months waiting period.

[25] Remember that the Recruitment Plan provides a different subsidy scheme for workers which are unemployed for more than 24 months.

time. We estimate the effect in the first and the second year of subsidised employment and after the end of the subsidies.

We cannot identify job-to-job changes in the analysis. For purposes of interpretation it is important to realise that the subsidy is assigned to a working contract: if a subsidised worker moves form one job to another, the subsidy necessarily comes to an end. Transitions from subsidised to unsubsidised employment are therefore necessarily job-to-job changes, unless the transition occurs after the end of the entitlement period.

To estimate the effect of participation in subsidised employment we have to take into account that the participants might be systematically different from the workers in the control group. The group of participants might constitute a particular selection of workers. Therefore, a valid causal analysis requires that we control for the characteristics of the workers (Heckman et al. (1999), Costa-Dias and Blundell (2002)). Since the subsidy is provided to the employer, we cannot a priori assume that the "participating" employer are comparable to the non-participating ones. Typically, microeconometric evaluation studies control only for selection of the participating workers. If this is the case then the effect of participation of the workers on their labour market outcome could reflect the effect of the actual subsidy as well as the selection of the employer. To take selection problems into account, we will therefore control for the characteristics of the workers and employers. We include a large set of explanatory variables in our duration model. These variables contain information about individual characteristics, the household of the worker, the local labour market conditions and the employer. We refer to section 3 for the description of the available data.

Besides controlling for observable characteristics of workers and employers in our main analysis, we allow for selection in unobservable characteristics of the workers in the sensitivity analysis.[26]

To control for selection in unobservables for the worker we follow an approach similar to Abbring and van den Berg (2003b). The main idea is to allow for dependencies of unobserved heterogeneity (UH) terms in the different transitions by specifying a multivariate distribution for the unobserved heterogeneity terms. For the implementation we have to

[26]It would be interesting to develop empirical models which control for selection in unobservable characteristic of workers *and* employers.

include the transitions to subsidised/regular employment in our empirical model. We can identify the unobserved heterogeneity within our duration model conditional on some structural assumptions. For a discussion of identification of the multivariate mixed proportional hazard model we refer to Heckman and Honoré (1989) and Abbring and van den Berg (2003a) and for a recent non-technical summary to van den Berg (2005).[27] Identification requires the presence of two continuous explanatory variables, which have different effects on the transition rates to the competing outcomes (subsidised and regular employment).[28] We include three continuous variables in our model: unemployment rates, age and the moment of entry into paid-unemployment. The age variable and the moment of entry are only available in grouped form (i.e. years of age and month of entry) and provide therefore only a proxy to real continuous variables.

The labour market states can only be observed at the end of each quarter but we have information about the inflow into paid-unemployment on a monthly basis. This information can be used to identify monthly transition rates out of unemployment. The following example illustrates why this is the case. Let us assume that there are workers who have entered unemployment at the start of June and who have left unemployment already by the end of the second quarter, i.e. June. Since, for these workers we know with certainty that they had a transition during their first month of paid-unemployment, this information allows us to identify the transition rates out of unemployment for the first month. Furthermore let us assume that there is a second group of workers who enter unemployment at the start of May and who have left unemployment by the end of June. For these workers we know that they had a transition during their first two months of unemployment. Now, since we know already the transition rate for the first month (identified by the first group), the workers who leave within a two-month interval enable us to identify the transition rates out of unemployment for the second month, and so on. It is important for identification of the monthly transition rates that the time-intervals in which the transitions occur have a partial overlap. Our example shows that identification

[27] The identification is different from what is known as the "timing-of-events" approach (Abbring and van den Berg (2003b)) which has frequently been applied for evaluation purposes in the last years.

[28] More exactly, the joint support of the explanatory variables has to contain a non-empty open set in $\mathbb{R}^2$ and the vectors of the corresponding parameters must form a non-singular matrix. One possibility to weaken the identifying assumptions considerably would be the inclusion of repeated observations. See Honoré (1993) and Abbring and van den Berg (2003a).

of monthly transition rates is possible, despite the fact that the labour market states can only be observed at the end of each quarter. Ignoring this information would lead to estimates which are less precise, since we would not use all available information about the duration. We show how to integrate the information about the monthly inflow when deriving the individual likelihood contributions.

The likelihood-function

Since the maximum likelihood function of the model without multivariate unobserved heterogeneity can be represented as a restricted version of the more general model, we present only the latter one, here.

We specify a competing risks, multivariate mixed proportional hazard model (van den Berg (2001)) and distinguish four different labour market states: unemployment u, regular employment r, employment starting with subsidies p and finally non-employment n.

We only consider the transitions of figure 7 between these four states and workers who have a different transition are right-censored, one time period before. In the case where no transition is observed, the respective spell is right-censored at the end of the observation period.

Specification of the transition rates As mentioned above we specify a *mixed proportional hazard model* where explanatory variables x and the unobservables V shift a baseline hazard $\lambda(t)$ for each transition proportionally. Using the letter l for the origin state m for the destination state, the transition rates $\theta_{lm}(t|\cdot)$ for the four possible transitions can be written as:

$$\theta_{lm}(t|x, V_m) = \lambda^{lm}(t) \cdot \exp(x'\beta^{lm} + V_m) \tag{1}$$

where $lm \in \{ur, up, rn, pn\}$.

We we assume that $V = (V_r, V_p, V_n)$ are draws from a trivariate random distribution. These draws are assumed to be independent of the observed explanatory variables x. In a specification without unobserved heterogeneity the V's are simply zero.

We specify a piecewise constant hazard rate which implies that we can write the baseline hazard rates as $\lambda^{lm}(t) = \exp(\sum_{k=1}^{K_{lm}} \alpha_k^{lm} \mathbb{1}_k^{lm}(t))$ where K_{lm} is the number of periods for the duration in origin state l with destination state m and $\mathbb{1}_k^{lm}(t) = 1$ if $t \in (t_{k-1}^{lm}, t_k^{lm}]$ and $\mathbb{1}_k^{lm}(t) = 0$ otherwise.[29] We impose the following normalisation: $\alpha_1^{ur} = \alpha_1^{up} = \alpha_1^{rn} = \alpha_1^{pn} = 0$.

Note that $t \in (t_{k-1}^{lm}, t_k^{lm}]$ means that the transition from one state to another occurs in the k-th period. This type of model is referred to as a grouped duration model in the literature (Prentice and Gloeckler (1978), Kiefer (1988)).

The survival rate in unemployment at the end of the k-th time period is noted by $S_u(t_k|.)$ and is related to the transition rate by:

$$S_u(t_k|x, V_r, V_p) = \exp\left[-\sum_{j=1}^{k} [\theta_{ur}(t_j|x, V_r) + \theta_{up}(t_j|x, V_p)]\right] \tag{2}$$

The survival rates in subsidised employment S_p and regular employment S_r are simplified versions of equation 2 and can be found in the appendix.

To capture the *effect of participation in subsidised employment* we impose the following restrictions:

$\alpha_k^{pn} = \alpha_k^{rn} + \delta_{11}$ for $k \leq 5$ (first year of participation)

$\alpha_k^{pn} = \alpha_k^{rn} + \delta_{12}$ for $k > 6$ (second year of participation)

$\alpha_k^{pn} = \alpha_k^{rn} + \delta_2$ for the employment duration after participation in subsidised employment

We also restrict $\beta^{pn} = \beta^{rn}$. This is equivalent to a model where we estimate one transition rate from employment to non-employment and the effects of subsidised employment are captured by a time-varying dummy structure.

Individual contributions to the likelihood

The contributions to the likelihood function depend on the individual trajectories on the labour market.[30] Using the notation for the conditional transition- and survival rates of equation 1 and 2 we can summarise the individual likelihood contributions as:

[29] Note that for origin state u we have monthly periods. For the other origin states (r and p) we have quarterly periods. Note also that $t_0^{lm} \equiv 0$ and $t_K^{lm} = +\infty$.

[30] We refer to the appendix for details on the derivation of the individual contributions.

$$
\begin{aligned}
l_m \quad = \quad & \sum_{j=0}^{s} \left\{ \frac{[\theta_{ur}(t_{k+j}|\cdot)]^{(1-p_{up})} \cdot [\theta_{up}(t_{k+j}|\cdot)]^{p_{up}}}{\sum_{m\in\{r,p\}} \theta_{um}(t_{k+j}|\cdot)} \left[S_u(t_{k+j-1}|\cdot) - S_u(t_{k+j}|\cdot)\right] \right\}^{d_u} \times \\
& [S_r(t_{l-1}|\cdot) - S_r(t_l|\cdot)]^{d_r} \times \\
& [S_p(t_{l-1}|\cdot) - S_p(t_l|\cdot)]^{d_p} \times \\
& S_u(t_{k-1}|\cdot)^{c_u} \times S_r(t_{l-1}|\cdot)^{c_r} \times S_p(t_{l-1}|\cdot)^{c_p}
\end{aligned} \tag{3}
$$

Although not explicitly written, all terms used in equation 3 are conditional on a set of (possibly time-varying) explanatory variables and are subject to the above mentioned assumptions. We suppress these elements from the notation for the purpose of simplification. The indicator variables d_u, d_r, d_p are equal to one if the worker has a transition out of the respective state and zero otherwise. c_u, c_r, c_p are indicators which are one if the worker is censored in the respective state and zero otherwise. Finally p_{up} indicates a transition to subsidised employment. The individual contributions to the likelihood can be represented by a combination of these indicators, e.g. if a worker has $p_{up} = d_u = d_p = 1$ and the other indicators are equal to zero then the worker has a transition from unemployment to subsidised employment and a transition out of subsidised employment. All the other components in equation 3 are then neutralised. Equation 3 covers all possible trajectories of our model, including right censoring.

The first line of equation 3 represents the individual likelihood contribution for the competing transitions out of unemployment. Note that we incorporate the information about the month of inflow into paid-unemployment.[31] The variable s indicates if the worker leaves unemployment within a one, two or three months interval after entering paid-unemployment.[32]

There is only one possible destination state for transitions out of employment. Therefore the individual likelihood contribution for a transition out of employment is just the difference between the survival rate at the end of the transition-period and the survival rate at the end of the preceding period.

[31] For the derivation of the formula we refer to the appendix.

[32] The indicator s ensures that the equation of the likelihood contribution is adapted to the accuracy of the observation.

The last line of equation 3 contains the likelihood contribution of workers who are censored. Their contribution is equal to the survival rate at the end of the observation period that precedes the period of the censoring event.

The likelihood contribution in the case of unobserved heterogeneity (UH): Given the independence assumption for V we can integrate out the unobserved heterogeneity terms and we obtain the unconditional likelihood contributions. Now the individual likelihood contribution becomes:

$$l_m = \int_v l_m(V) dG(V) \tag{4}$$

where $G(V)$ is the joint distribution of the heterogeneity terms.

Specification of the heterogeneity distribution: Suppose that $v_m (m \in \{r, p, n\})$ can take two values v_{m1} and v_{m2} for each possible destination state m. This results in a discrete joint heterogeneity distribution with eight points of support. The associated probabilities p_j are specified by a multinomial logit model:

$$p_j = \frac{exp(\lambda_j)}{1 + \sum_{i=1}^{7} \exp(\lambda_i)} \quad for\, j = 1, ..., 7 \;\; and \;\; p_8 = 1 - \sum_{j=1}^{7} p_j \tag{5}$$

Discrete specifications of the heterogeneity distribution are popular in empirical work. They are shown to remain computationally feasible while providing the desired flexibility for the correlation of unobserved components (van den Berg (2001)).
The corresponding individual likelihood components of equation (4) can now be written as:

$$l_m = \sum_{a=1}^{2} \sum_{b=1}^{2} \sum_{c=1}^{2} P_{abc} \cdot l_m(v_{ra}, v_{pb}, v_{nc}) \tag{6}$$

The equations for the different transition rates and the multivariate distribution for the unobserved heterogeneity are estimated simultaneously by the means of maximum likelihood.

When specifying our econometric model we tried to minimise the structural assump-

tions we had to impose. This is the reason why we specify a flexible piecewise constant baseline hazard and the unobserved heterogeneity as a discrete distribution.

5 Estimation Results

In this section we concentrate on the key results of our estimation, namely the estimates of the effect of participation in subsidised employment on the transition rate from employment to non-employment. For the estimation results of other explanatory variables and the baseline hazards we refer to table 2 and table 3 in the appendix.

As explained above, in our empirical model the effect of subsidised employment is summarised by three parameters. Two of them are for the first and the second year of subsidised employment. These two parameters allow to capture time-varying effects which may result from the change in the level of the subsidies after one year. The third parameter captures a potential effect of participation after the subsidised employment period.

To control for selection we include a large set of explanatory variables in our mixed proportional hazard model. We have variables about individual characteristics such as age, citizenship, school degree and the month of entry into paid-unemployment. The variables for the household characteristics are the position of the worker in the household and the number of small children in the household. To capture differences in the local unemployment market we also include the local unemployment rates and regional dummies. In addition, we include the time in the preceding unemployment spell as a explanatory variable for the duration in employment. Like explained above, all workers in our database enter paid-unemployment after a waiting period of nine months and have no previous employment spells. The database is stratified with respect to the gender of the workers.

The upper part of table 4 shows the parameter estimates for the effect of participation in subsidised employment when we control only for the (observed) characteristics of the workers. We find a significant negative effect of participation in subsidised employment on the transition rate from employment to non-employment during the first year of subsidised employment. The (non-significant) estimates for the 2nd year of sub-

sidised employment and the period after the subsidised employment indicate that the effect for women vanishes and is even reversed for the men.

However, the descriptive statistics in section 3 indicate significant differences between the observed characteristics of the employers of regular and subsidised workers. These differences might affect the labour market outcome. When we control only for the characteristics of the workers it would be hard to distinguish between the effect of the subsidies and the selection of employers.

Table 4: Estimated effect of temporary subsidies on the transition rates from employment to non-employment

	1st year	2nd year	after the subsidies	total effect
obs. char. of workers				
women	$-29\%^*$	-22%	$+5\%$	$-25\%^*$
men	$-36\%^*$	$+36\%$	$+60\%$	$-21\%^*$
obs. char. of workers and employers				
women	$-30\%^*$	-23%	-7%	$-26\%^*$
men	$-36\%^*$	$+38\%$	$+34\%$	$-22\%^*$
obs. char. workers and employers and UH				
women	-7%	-26%	$+6\%$	-8%
men	-48%	-22%	$+1\%$	-53%

Note: Estimates which are marked by a * are significant different from zero at the 95% confidence level. The upper part reports the estimates when we control for the observed characteristics of the workers. The middle part when controlling for observed characteristics of workers and employers. The lower part refers to the case where we allow for selection in unobserved heterogeneity (UH) for the worker.

To control for selection in the characteristics of the employer we include their observed characteristics in our empirical model, in the next step. We include sector-dummies, information about the size of the employer and some dummies to control for a particular nature of employers.[33] The middle part of table 4 summarises the effects of participation in subsidised employment on the transition rate from employment to non-employment, when we control for the characteristics of the workers as well as for the characteristics of the employer.

The estimation results with and without employer characteristics are remarkable close to each other. It seems that in our study the differences in the characteristics between the participating and the non-participating employers do not play a decisive role for the ef-

[33] Like self-employment, or local public administration.

fects on the employment duration during the first and second year of the subsidy. Only the parameter estimates for the time after the subsidy appear to be different, however they are characterised by large standard errors.

During the first year of employment the transition rate from employment to non-employment is significantly lower for workers in subsidised employment. The reduction in the transition rate is 30% for women and 36% for men. The estimates for the second year and after the end of the subsidies suggest that this effect is not persistent. The parameters indicate that the effect of the subsidies goes down for women and is even reversed for men. However these estimates are characterised by large standard errors and should be interpreted with caution.

Note that the results are compatible with the economic intuition provided by the theoretical literature. Mortensen and Pissarides (2003) argue that a *hiring subsidy* would lead to shorter unemployment durations but increase unemployment incidence and lead consequently to a higher turnover on the labour market. In contrast, *permanent employment subsidies* lead to higher employment whereas the new steady state is characterised by a lower reservation productivity. Therefore a permanent flow of employment subsidies increases the expected employment duration. A temporary employment subsidy could be regarded as a policy which lies in between hiring subsidies and a permanent employment subsidy since it shares characteristics of both policies.[34] During the subsidy the situation is similar to the case of a permanent subsidy: the flow of subsidies can be expected to lower the reservation productivity and would consequently lead to a lower transition rate out of employment. Similar to a hiring subsidy, a temporary employment subsidy increases the opportunity cost of maintaining a match after the end of the subsidy. This is due to the fact that the employer could lay off and search another worker who is entitled to the subsidy.

When the intuition of this model is translated into our empirical model then we would expect lower transition rates out of employment during a temporary employment subsidy and higher transition rates after the end of the subsidy. Roughly speaking the results in table 4 are in line with this prediction. However we should keep in mind that,

[34] A complete analysis of the dynamics of temporary employment subsidies in a non-stationary framework is beyond the scope of this paper.

different from Mortensen and Pissarides (2003) who model job-duration, here we are investigate the effects on employment duration.[35]

If the employment duration is indeed longer during the subsidies we could have additional effects which are not considered in the discussed theoretical model. For example longer employment duration during the first year of subsidies could have an impact on the accumulation of human capital on the job which itself could have an effect on employment duration.

It is not obvious to infer the total effect on the employment duration from the time-varying effects. Especially for the men it is not immediately clear if the negative effect of the transition rate out of employment for the first year are counter-balanced by the positive effects in the second year and after the subsidised employment. For the total effect one has to consider that the time-varying effects apply only conditional on staying in employment over time. For example the effect for the second year applies only conditional on staying in subsidised employment for at least one year. This implies that the number of workers who are actually affected by the time-varying effects declines with time. The survival rates in figure 2 and 3 suggest that the number of workers who are concerned by the effects declines with time.[36] The number of workers who are affected by the negative effect during the first year of subsidised employment is larger than the number of workers who is affected by the positive effects afterwards. To complete our results we report the total (non-timevarying) effects of participation on the transition rate out of employment. As we can see from table 4 the effects for the first year outweigh the effects for the second year and after subsidised employment and the total effect on the transition rate is negative for all estimations. This translates into a longer expected employment duration caused by participation in subsidised employment.[37]

As a sensitivity analysis we estimate a model where we allow for correlation in un-

[35]By concentrating on the employment duration we allow for change of the employer. This is different from Mortensen and Pissarides (2003) where a destroyed jobs lead necessarily to unemployment.

[36]Figure 2 and 3 refer to time in employment that started with subsidised employment. This is different from time in subsidised employment since it also comprises workers in employment after an interruption of the subsidised employment.

[37]Under the strong assumption of "absence of general-equilibrium effects" a cost-benefit analysis could be based on the comparison of the total effect on the employment duration and the cost of the subsidies.

The effect on the employment duration could itself have an impact on the duration of subsequent non/unemployment spells, e.g. via networking or the accumulation of human capital. See Cockx and Göbel (2005) and Cockx and Göbel (2006) for an empirical analysis of the effect of participation in subsidised employment on the subsequent unemployment duration.

observed heterogeneity terms of the different transitions. Like described in section 4 our estimates might be biased if the participants in the subsidised employment program are a non-random sample with respect to their unobserved characteristics. If this is the case, the estimates would reflect this selection. The lower part of table 4 provides the results of the model with unobserved characteristics. The estimates for the effect of subsidised employment maintain their general pattern: The parameter estimates indicate that the transition rate from employment to non-employment during the subsidies is lower for participants. After the end of the subsidies a preceding participation causes a higher transition rate out of employment. However the standard errors get large and none of the parameters of interest is significant any more. Expanding our study to a longer time period could be helpful to get more robust estimates. This would allow us to integrate repeated participation in our empirical model. Honoré (1993) shows that this is helpful for identification.

6 Conclusion

In this paper we estimated the effect of participation in subsidised employment for young long-term unemployed workers. The analysed subsidy has the form of a reduction of social insurance contributions which is provided to the employer for two years. This paper provides causal evidence on the effect of subsidies on employment duration. By focusing on the effect of program participation on the employment duration we contrast subsidised employment to a hypothetical situation where a worker would have found a regular employment instead.

We show how a multivariate mixed proportional hazard model can be used, in the presence of non-random selection, to evaluate the effect of participation in subsidised employment on the employment duration. The model has the virtue of providing a way to control for selection in unobserved characteristics. To phrase it more cautiously, multivariate MPH-models can be used for a sensitivity analysis - they allow to test if results obtained by classical proportional hazard models are robust with respect to selection in unobservable characteristics.

Controlling for a large set of observable characteristics, our estimates indicate that

the subsidies have a positive effect on the duration in employment during the first year of participation in subsidised employment. We don't find significant effects in the second year or after participation in subsidised employment. The estimates indicate that the effect of participation in subsidised employment diminishes over time. The total effect on the transition rate from employment to non-employment is negative. Therefore, the expected duration in employment increases because of a participation in the subsidised employment program. However, when controlling for selection in unobserved characteristics it turns out that the standard error get large and statistical inference is not feasible.

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Appendix

A Individual contributions to the likelihood

For the initial *unemployment* state we define two random durations:

T_{ur} := the random duration until regular employment

T_{up} := the random duration until subsidised employment

For the subsequent *employment state* we distinguish:

T_{rn} := the random duration in regular employment until non-employment

T_{pn} := the random duration in employment until to non-employment, whereas the employment spell starts with subsidies.

We assume that all individual differences in the joint distribution $T = (T_{up}, T_{ur}, T_{rn}, T_{pn})$ can be characterised by explanatory variables X, V where X is observed and V is not.

The joint distribution $T|X, V$ can be expressed in terms of the distributions $(T_{up}|X = x, V)$, $(T_{ur}|X = x, V)$, $(T_{pn}|T_u = t_u, X = x, V)$ $(T_{rn}|T_u = t_u, X = x, V)$. The latter distributions are characterised by their transition rates:

$\theta_{up}(t|x, V)$, $\theta_{ur}(t|x, V)$, $\theta_{pn}(t|t_u, x, V)$, $\theta_{rn}(t|t_u, x, V)$.

See equation 1 for the specification of the transition rates.

Let $V := (V_p, V_r, V_n)$ be a (3×1)-vector of unobserved covariates.

Let $T_{ur} \perp\!\!\!\perp (V_p, V_n)|x, V_r$, implying that $\theta_{ur}(t|x, V) = \theta_{ur}(t|x, V_r)$

Let $T_{up} \perp\!\!\!\perp (V_r, V_n)|x, V_p$, implying that $\theta_{up}(t|x, V) = \theta_{up}(t|x, V_p)$

Let $T_{rn} \perp\!\!\!\perp (V_r, V_p)|t_u, x, V_n$, implying that $\theta_{rn}(t|t_u, x, V) = \theta_{rn}(t|t_u, x, V_n)$

and $T_{pn} \perp\!\!\!\perp (V_r, V_p)|t_u, x, V_n$, implying that $\theta_{pn}(t|t_u, x, V) = \theta_{pn}(t|t_u, x, V_n)$.

Depending on the individual labour market trajectories the contributions to the likelihood are different. We can distinguish the following cases:

1. Right censored at unemployment duration t_k:

$$
\begin{aligned}
l_1(V) &= P(T_{ur} > t_k, T_{up} > t_k|\cdot) && (7)\\
&= \exp\left[-\int_0^t \left[\theta_{ur}(\tau|x, V_r) + \theta_{up}(\tau|x, V_p)\right] d\tau\right] && (8)\\
&= \exp\left[-\sum_{j=1}^{k} \left[\theta_{ur}(t_j|x, V_r) + \theta_{up}(t_j|x, V_p)\right]\right] && (9)\\
&= S_u(t_k|x, V_r, V_p) && (10)
\end{aligned}
$$

The individual likelihood contribution in the case of right censoring at unemployment duration t_k is the survival rate in a competing risk model at the end of the time period t_k. Note that we do not assume independence between the different transitions in the competing risk specification of the model.

2. Leaving for regular employment within $(t_{k-1}, t_{k+s}]$ (for $s \in \{0,1,2\}$) and right censored in regular employment after t_l quarters:

$$
\begin{aligned}
l_2(V) &= P(t_{k-1} < T_{ur} \leq t_{k+s}, T_{ur} > t_l|\cdot) \\
&= \int_{t_{k-1}}^{t_{k+s}} \theta_{ur}(t|x,V_r) \exp\left[-\int_0^t [\theta_{ur}(\tau|x,V_r) + \theta_{up}(\tau|x,V_p)]\, d\tau\right] dt \;\times \qquad (11) \\
&\quad \exp\left[-\int_0^{t_l} \theta_{rn}(t_j|t_u = t_{k+s}, x, V_n)\right] \\
&= \sum_{j=0}^{s} \left\{ \frac{\theta_{ur}(t_{k+j}|x,V_r)}{\theta_{ur}(t_{k+j}|x,V_r) + \theta_{up}(t_{k+j}|x,V_r)} \left[\exp\left[-\sum_{i=1}^{k+j-1} (\theta_{ur}(t_i|x,V_r) + \theta_{up}(t_i|x,V_p))\right] - \right.\right. \\
&\quad \left.\left. \exp\left[-\sum_{i=1}^{k+j} (\theta_{ur}(t_i|x,V_r) + \theta_{up}(t_i|x,V_p))\right]\right]\right\} \times \\
&\quad \exp\left[-\sum_{j=1}^{l} \theta_{rn}(t_j|t_u = t_{k+s}, x, V_n)\right] \qquad (12) \\
&= \sum_{j=0}^{s} \left\{ \frac{\theta_{ur}(t_{k+j})}{\sum_{m\in\{r,p\}} \theta_{um}(t_{k+j})} [S_u(t_{k+j-1}) - S_u(t_{k+j})] \right\} S_r(t_l|t_u = t_{k+s}) \qquad (13)
\end{aligned}
$$

where in the last line (and the sequel) the conditioning on x and V is implicit. Again we allow for possible dependencies between the different transitions of the model.

See Cockx (1997) for derivation from equation (11) to equation (12). Note that we consider an interval wider than 1 month: $(t_{k-1}, t_{k+s}]$ for $s \in \{0,1,2\}$ rather tan $(t_{k-1}, t_k]$. The reason is that during unemployment we observe the elapsed duration in months, but the transitions only with a precision up to a quarter. In general, $s = 2$. However, if an individual enters within the last month of the quarter and has already left unemployment by the end of the quarter, then $s = 0$. Similarly, $s = 1$ if one enters in the second month and leaves by the end of the first quarter.

3. Leaving for regular employment within $(t_{k-1}, t_{k+s}]$ (for $s \in \{0,1,2\}$) and leaving for non-employment within $(t_{l-1}, t_l]$.

$$
\begin{aligned}
l_3(V) &= P(t_{k-1} < T_{ur} \leq t_{k+s}, t_{l-1} < T_{rn} \leq t_l|\cdot) \\
&= \sum_{j=0}^{s} \left\{ \frac{\theta_{ur}(t_{k+j})}{\sum_{m\in\{r,p\}} \theta_{um}(t_{k+j})} [S_u(t_{k+j-1}) - S_u(t_{k+j})] \right\} [S_r(t_{l-1}) - S_r(t_l)] \qquad (14)
\end{aligned}
$$

4. Leaving for programme participation within $(t_{k-1}, t_{k+s}]$ and right censored during programme participation at t_l

$$
\begin{aligned}
l_4(V) &= P(t_{k-1} < T_{up} \leq t_{k+s}, T_{pr} > t_l, T_{pn} > t_l|\cdot) \\
&= \sum_{j=0}^{s} \left\{ \frac{\theta_{up}(t_{k+j})}{\sum_{m\in\{r,p\}} \theta_{um}(t_{k+j})} [S_u(t_{k+j-1}) - S_u(t_{k+j})] \right\} S_p(t_l|t_{ur} = t_{k+s}) \qquad (15)
\end{aligned}
$$

5. Leaving for programme participation within $(t_{k-1}, t_{k+s}]$ and leaving to non-employment from programme participation within $(t_{l-1}, t_l]$.

$$\begin{aligned} l_5(V) &= P(t_{k-1} < T_{up} \leq t_{k+s}, t_{l-1} < T_{pn} \leq t_l | \cdot) \\ &= \sum_{j=0}^{s} \left\{ \frac{\theta_{up}(t_{k+j})}{\sum_{m \in \{r,p\}} \theta_{um}(t_{k+j})} \left[S_u(t_{k+j-1}) - S_u(t_{k+j}) \right] \right\} \left[S_p(t_{l-1}) - S_p(t_l) \right] \end{aligned} \quad (16)$$

See equation 3 in section 4 for a compact way of writing the individual likelihood contributions.

B Tables

Table 1: Descriptive Statistics

	women			men		
	all	**regular employm.**	**subsid. employm.**	**all**	**regular employm.**	**subsid. employm.**
Number of workers	8720	3156	257	6497	2776	246
INDIVIDUAL CHARACTERISTICS:						
Age at the end of 1997	20.4	20.8	20.6	20.5	20.7	20.7
standard error	2.0	2.0	1.9	2.0	2.0	2.0
Nationality						
Belgian	87.8%	91.4%	87.9%	89.1%	89.4%	88.6%
EU not Belgian	5.4%	4.6%	7.4%	5.1%	5.6%	7.3%
Not EU	6.8%	4.0%	4.7%	5.8%	5.0%	4.1%
School degree						
Primary school	7.9%	3.6%	5.1%	12.0%	9.1%	7.7%
Lower secondary school	22.1%	13.4%	14.0%	27.5%	23.2%	23.6%
Higher secondary school	48.0%	49.2%	53.3%	42.3%	45.2%	49.2%
College - non-university	12.4%	19.2%	14.4%	8.5%	10.3%	10.6%
College - university	5.1%	7.7%	6.2%	4.4%	5.8%	3.7%
Other education	0.8%	0.5%	0.8%	0.9%	0.7%	1.2%
Unknown education	3.8%	6.3%	6.2%	4.4%	5.7%	4.1%
Month of entry in paid-unemployment						
Month of entry 1,2,7,8,9,10,11,12	27.4%	20.8%	24.1%	30.5%	28.2%	25.6%
Month of entry 3,5,6	40.5%	42.0%	40.1%	42.4%	43.4%	38.6%
Month of entry 4	32.1%	37.3%	35.8%	27.1%	28.4%	35.8%
Characteristics of the household:						
Head of the household (o.t.h.)	9.6%	6.6%	8.2%	8.4%	7.0%	7.3%
Husband/wife of the head o.t.h.	5.5%	3.4%	3.9%			
Son/daughter of the head o.t.h.	72.5%	80.4%	82.1%	84.9%	86.7%	87.8%
Other family relationships to the head o.t.h.	2.3%	1.7%	1.2%	3.0%	2.9%	2.4%
No family relationship to the head o.t.h.	10.1%	8.0%	4.7%	3.7%	3.4%	2.4%
Number of persons in the household						
Indicator (# of persons in the household [0-3) >0)	10.0%	5.1%	7.4%	3.2%	2.7%	2.0%
Mean (# of persons in the household [0-3))	1.1	1.1	1.1	1.2	1.1	1.4
Indicator (# of persons in the household [3-12) >0)	15.2%	12.9%	14.0%	15.7%	15.0%	11.4%
Mean (# of persons in the household [3-12))	1.4	1.4	1.4	1.4	1.4	1.4
Total # of persons in the household	2.7	2.7	2.9	2.8	2.8	2.9
standard error	1.9	1.6	1.8	1.8	1.7	1.7
LABOUR MARKET CHARACTERISTICS:						
Local unemployment rate at the end of 1997	26.9	25.7	27.6	18.5	17.8	19.6
standard error	8.4	8.6	7.7	6.7	7.0	6.2
Region of residence						
Flemish region	24.8%	31.0%	21.4%	19.6%	24.1%	12.6%
Walloon region	63.8%	59.1%	66.5%	67.7%	64.8%	73.6%
Brussels region	11.5%	9.9%	12.1%	12.7%	11.1%	13.8%
EMPLOYER CHARACTERISTICS:						
Sector						
Manufacture of food products and beverages		1.3%	3.5%		1.3%	2.9%
Construction		0.1%	1.2%		4.5%	18.3%
Retail trade, except of motor vehicles and motorcycles, repair of personal and household goods		11.0%	20.6%		4.2%	7.3%
Hotels and restaurants		5.4%	12.5%		4.7%	10.2%
Other business activities		28.7%	20.2%		37.0%	24.0%
Public administration and defence, compulsory social security		11.1%	0.0%		8.7%	0.0%
Education		8.0%	1.6%		2.5%	1.6%
Health and social work		14.8%	17.9%		4.4%	8.1%

	women			men		
	all	**regular employm.**	**subsid. employm.**	**all**	**regular employm.**	**subsid. employm.**
Agriculture, hunting and forestry		1.9%	1.2%		2.7%	2.0%
Manufacturing, Recycling		2.2%	4.7%		8.2%	6.1%
Electricity, gas and water supply		1.1%	0.0%		1.3%	0.4%
Wholesale and sale, repair of motor vehicles, motorcycles and personal and household goods		2.3%	4.3%		3.6%	7.7%
Transport, storage and communication		3.6%	0.8%		7.7%	5.7%
Financial intermediation		1.9%	0.8%		2.0%	0.0%
Real estate, renting and business activities		0.7%	2.3%		1.8%	2.0%
Other community, social and personal service activities		4.3%	8.6%		4.3%	3.7%
Mining + Activities of households as employers of domestic staff + Badly defined activities		1.5%	0.0%		0.8%	0.0%
Employer is a APL-agency		9.4%	0.0%		6.1%	0.0%
Self-employment		0.1%	0.0%		0.3%	0.0%
Size						
Indicator for the size of the employer		6.7	4.1		6.7	3.9
standard error		2.8	3.0		2.8	2.9
LABOUR MARKET TRAJECTORY:						
# employment spells	0.7	1.5	1.4	0.8	1.5	1.4
# unemployment spells	1.3	1.8	1.6	1.4	1.8	1.7
# spells in total	2.0	3.4	3.0	2.2	3.3	3.1

Note: *Regular employment* refers to the workers who have a transition from unemployment to regular employment. *Subsidised employment* refers to the workers who have a transition from unemployment to subsidised employment. *All* refers to all workers at the beginning of the observation period.

Table 2: Estimation results - women

-log (likelihood)		18578.6			18421.1	
# parameters		101			110	
# observations		8720			8720	
		no UH			**with UH**	
women	**b**	**exp(b)**	**p-value**	**b**	**exp(b)**	**p-value**
EXPLANATORY VARIABLES						
Unemployment to regular employment						
Age - mean(age)	0.009	1.009	0.363	0.011	1.011	0.991
Belgian						
EU not Belgian	−0.128	0.880	0.085	−0.132	0.876	0.895
Not EU	−0.675	0.509	0.000	−0.735	0.480	0.463
Primary school	−0.878	0.416	0.000	−0.939	0.391	0.348
Lower secondary school	−0.574	0.563	0.000	−0.620	0.538	0.535
Higher secondary school						
College - non-university	0.637	1.891	0.000	0.713	2.040	0.476
College - university	0.670	1.955	0.000	0.731	2.077	0.465
Other education	−0.656	0.519	0.003	−0.700	0.497	0.484
Unknown education	0.904	2.469	0.000	0.944	2.569	0.345
Month of entry 1,2,7,8,9,10,11,12	−0.162	0.851	0.000	−0.176	0.839	0.860
Month of entry 3,5,6	0.049	1.051	0.165	0.062	1.064	0.950
Month of entry 4						
Head of the household (o.t.h.)	−0.220	0.802	0.000	−0.235	0.790	0.814
Husband/wife of the head o.t.h.	−0.385	0.680	0.000	−0.417	0.659	0.676
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	−0.238	0.788	0.051	−0.266	0.767	0.790
No family relationship to the head o.t.h.	−0.101	0.904	0.083	−0.118	0.889	0.906
# of persons in the household [0-3)	−0.527	0.590	0.000	−0.563	0.570	0.574
# of persons in the household [3-12)	−0.054	0.947	0.083	−0.059	0.943	0.953
Local unemployment rate - quarter of entry	−0.022	0.978	0.000	−0.024	0.976	0.981
Walloon region						
Flemish region	0.289	1.335	0.000	0.334	1.397	0.738
Brussels region	0.037	1.038	0.535	0.055	1.056	0.956
Unemployment to subsidized employment						
Age - mean(age)	−0.022	0.979	0.641	−0.025	0.976	0.980
Belgian						
EU not Belgian	0.188	1.207	0.444	0.211	1.235	0.833
Not EU	−0.577	0.562	0.088	−0.706	0.494	0.480
Primary school	−0.711	0.491	0.036	−0.814	0.443	0.416
Lower secondary school	−0.681	0.506	0.001	−0.775	0.461	0.438
Higher secondary school						
College - non-university	0.491	1.633	0.022	0.686	1.986	0.493
College - university	0.765	2.149	0.013	0.973	2.647	0.330
Other education	−0.288	0.750	0.711	−0.375	0.687	0.708
Unknown education	1.809	6.106	0.000	2.133	8.438	0.033
Month of entry 1,2,7,8,9,10,11,12	−0.001	0.999	0.997	−0.051	0.950	0.959
Month of entry 3,5,6	0.050	1.051	0.742	0.075	1.078	0.940
Month of entry 4						
Head of the household (o.t.h.)	−0.261	0.770	0.302	−0.289	0.749	0.773
Husband/wife of the head o.t.h.	−0.433	0.649	0.227	−0.518	0.596	0.604
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	−0.758	0.469	0.230	−0.829	0.437	0.407
No family relationship to the head o.t.h.	−0.789	0.454	0.012	−0.855	0.425	0.393
# of persons in the household [0-3)	−0.203	0.816	0.400	−0.265	0.767	0.791
# of persons in the household [3-12)	−0.110	0.896	0.366	−0.125	0.883	0.901
Local unemployment rate - quarter of entry	−0.011	0.989	0.417	−0.015	0.985	0.988
Walloon region						
Flemish region	−0.062	0.940	0.818	0.007	1.007	0.994
Brussels region	0.164	1.178	0.468	0.222	1.249	0.824

Table 2: Estimation results - women (continued)

women	no UH b	no UH exp(b)	no UH p-value	with UH b	with UH exp(b)	with UH p-value
Employment to non-employment						
Age - mean(age)	−0.029	0.971	0.066	−0.043	0.958	0.966
Belgian						
EU not Belgian	0.059	1.061	0.587	−0.021	0.980	0.983
Not EU	−0.102	0.903	0.422	0.099	1.104	0.921
Primary school	0.548	1.730	0.000	0.928	2.529	0.353
Lower secondary school	0.264	1.302	0.000	0.426	1.531	0.670
Higher secondary school						
College - non-university	−0.192	0.826	0.009	−0.351	0.704	0.726
College - university	−0.473	0.623	0.000	−0.699	0.497	0.485
Other education	0.239	1.270	0.408	0.634	1.885	0.526
Unknown education	−1.297	0.273	0.000	−1.879	0.153	0.060
Month of entry 1,2,7,8,9,10,11,12	−0.078	0.925	0.212	−0.064	0.938	0.949
Month of entry 3,5,6	−0.080	0.923	0.121	−0.103	0.902	0.918
Month of entry 4						
Head of the household (o.t.h.)	0.172	1.187	0.056	0.284	1.329	0.776
Husband/wife of the head o.t.h.	0.047	1.048	0.688	0.053	1.055	0.958
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	0.051	1.052	0.742	0.163	1.177	0.871
No family relationship to the head o.t.h.	0.160	1.174	0.057	0.217	1.242	0.829
# of persons in the household [0-3)	0.058	1.060	0.545	0.135	1.145	0.893
# of persons in the household [3-12)	0.031	1.031	0.500	0.084	1.088	0.933
Local unemployment rate - quarter of entry	0.007	1.007	0.122	0.013	1.013	0.989
Walloon region						
Flemish region	0.125	1.133	0.143	0.125	1.133	0.901
Brussels region	−0.039	0.961	0.651	−0.054	0.948	0.957
Manufacture of food products and beverages	0.004	1.004	0.981	0.124	1.132	0.901
Construction	−0.255	0.775	0.593	−0.556	0.573	0.578
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	−0.310	0.733	0.000	−0.560	0.571	0.576
Hotels and restaurants	−0.184	0.832	0.088	−0.338	0.713	0.735
Other business activities						
Public administration and defence; compulsory social security	−0.665	0.514	0.000	−1.349	0.260	0.177
Education	0.189	1.208	0.035	0.238	1.269	0.812
Health and social work	−0.525	0.592	0.000	−1.000	0.368	0.317
Agriculture, hunting and forestry	0.684	1.983	0.000	0.812	2.252	0.417
Manufacturing, Recycling	−0.346	0.707	0.029	−0.655	0.519	0.513
Electricity, gas and water supply	−0.692	0.500	0.036	−1.615	0.199	0.106
Wholesale and sale; repair of motor vehicles, motorcycles and personal and household goods	−0.618	0.539	0.001	−1.231	0.292	0.219
Transport, storage and communication	−1.069	0.343	0.000	−1.724	0.178	0.085
Financial intermediation	−0.812	0.444	0.001	−1.772	0.170	0.077
Real estate, renting and business activities	−0.725	0.484	0.033	−1.450	0.235	0.147
Other community, social and personal service activities	−0.190	0.827	0.122	−0.489	0.613	0.625
Mining+Activities of households as employers of domestic staff+Badly defined activities	−1.152	0.316	0.000	−2.017	0.133	0.044
APL	−0.309	0.734	0.003	−0.350	0.705	0.726
Self-employed	1.565	4.783	0.508	2.830	16.951	0.005
Size	0.010	1.010	0.830	0.008	1.008	0.993
Sizeˆ2	0.001	1.001	0.864	0.001	1.001	1.000
ln(unemployment-duration)	−0.023	0.977	0.433	−0.102	0.903	0.919
Participation 1st year	−0.353	0.703	0.002	−0.076	0.927	0.940
Participation 2nd year	−0.265	0.767	0.397	−0.298	0.743	0.766
After participation	−0.072	0.930	0.743	0.060	1.061	0.953

Table 2: Estimation results - women (continued)

women	no UH b	no UH exp(b)	no UH p-value	with UH b	with UH exp(b)	with UH p-value
BASELINE HAZARD						
Unemployment to regular employment						
Constant						
Quarter 2	−0.121	0.886	0.026	−0.059	0.943	0.953
Quarter 3	−0.252	0.777	0.000	−0.149	0.862	0.882
Quarter 4,5	−0.305	0.737	0.000	−0.154	0.857	0.877
Quarter 6,7	−0.308	0.735	0.000	−0.095	0.910	0.924
Quarter 8,9,10,11	−0.497	0.609	0.000	−0.224	0.799	0.823
Unemployment to subsidized employment						
Quarter 1						
Constant						
Quarter 3	−0.374	0.688	0.082	−0.229	0.795	0.819
Quarter 4	−0.646	0.524	0.010	−0.445	0.641	0.656
Quarter 5	0.169	1.185	0.382	0.447	1.563	0.655
Quarter 6,7,8,9,10,11	−1.852	0.157	0.000	−1.429	0.240	0.153
Employment to non-employment						
Constant						
Quarter 2	−0.686	0.504	0.000	−0.243	0.785	0.808
Quarter 3	−1.010	0.364	0.000	−0.323	0.724	0.746
Quarter 4	−0.658	0.518	0.000	0.255	1.290	0.799
Quarter 5,6	−1.411	0.244	0.000	−0.272	0.762	0.786
Quarter 7,8,9,10	−1.848	0.158	0.000	−0.293	0.746	0.770
DISTRIBUTION - Unobserved heterogeneity						
Points of support						
Unemployment to regular employment 1	−2.294	0.101	0.000	−2.013	0.134	0.044
Unemployment to regular employment 2				−3.051	0.047	0.002
Unemployment to subsidized employment 1	−4.729	0.009	0.000	−3.691	0.025	0.000
Unemployment to subsidized employment 2				-inf		
Employment to non-employment 1	−0.997	0.369	0.000	0.082	1.086	0.935
Employment to non-employment 2				−2.270	0.103	0.023
Probability parameters: lam_rpn						
lam_111				1.266	3.546	0.206
lam_112				2.458	11.679	0.014
lam_121				1.793	6.007	0.073
lam_122				1.600	4.951	0.110
lam_211				−0.038	0.963	0.970
lam_212				−2.542	0.079	0.011
lam_221				2.420	11.250	0.016
Probabilities: P_rpn						
P_111				0.090		
P_112				0.296		
P_121				0.152		
P_122				0.125		
P_211				0.024		
P_212				0.002		
P_221				0.285		
P_222				0.025		
Correlation of UH-terms						
corr(rp)				0.483		
corr(rb)				−0.526		
corr(pb)				−0.462		

Table 3: Estimation results - men

-log (likelihood)		15897.8			15767.4	
# parameters		95			103	
# observations		6497			6497	
		no UH			**with UH**	
men	**b**	**exp(b)**	**p-value**	**b**	**exp(b)**	**p-value**
EXPLANATORY VARIABLES						
Unemployment to regular employment						
Age - mean(age)	−0.021	0.980	0.066	−0.024	0.976	0.072
Belgian						
EU not Belgian	−0.010	0.990	0.899	−0.010	0.990	0.917
Not EU	−0.103	0.902	0.222	−0.122	0.885	0.205
Primary school	−0.569	0.566	0.000	−0.662	0.516	0.000
Lower secondary school	−0.403	0.668	0.000	−0.466	0.627	0.000
Higher secondary school						
College - non-university	0.314	1.369	0.000	0.380	1.462	0.000
College - university	0.338	1.402	0.000	0.394	1.483	0.000
Other education	−0.628	0.534	0.004	−0.735	0.479	0.003
Unknown education	0.731	2.077	0.000	0.770	2.159	0.000
Month of entry 1,2,7,8,9,10,11,12	0.021	1.021	0.657	0.004	1.004	0.949
Month of entry 3,5,6	0.139	1.149	0.001	0.148	1.160	0.002
Month of entry 4						
Head of the household (o.t.h.)	−0.143	0.867	0.036	−0.169	0.845	0.031
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	−0.017	0.983	0.866	0.006	1.006	0.956
No family relationship to the head o.t.h.	0.030	1.030	0.749	0.027	1.028	0.804
# of persons in the household [0-3)	−0.194	0.824	0.034	−0.231	0.794	0.028
# of persons in the household [3-12)	−0.002	0.998	0.950	−0.006	0.994	0.869
Local unemployment rate - quarter of entry	−0.016	0.985	0.000	−0.021	0.979	0.000
Walloon region						
Flemish region	0.228	1.256	0.002	0.249	1.282	0.004
Brussels region	0.067	1.069	0.248	0.094	1.098	0.162
Unemployment to subsidized employment						
Age - mean(age)	−0.023	0.977	0.586	−0.103	0.902	0.090
Belgian						
EU not Belgian	0.267	1.305	0.318	−0.011	0.989	0.977
Not EU	−0.335	0.716	0.347	−0.376	0.687	0.440
Primary school	−0.781	0.458	0.005	−1.294	0.274	0.001
Lower secondary school	−0.472	0.624	0.009	−0.854	0.426	0.001
Higher secondary school						
College - non-university	0.310	1.364	0.193	0.451	1.570	0.204
College - university	0.141	1.151	0.710	0.645	1.907	0.289
Other education	0.017	1.017	0.979	0.944	2.569	0.514
Unknown education	1.190	3.286	0.003	1.933	6.910	0.002
Month of entry 1,2,7,8,9,10,11,12	−0.285	0.752	0.113	−0.135	0.874	0.624
Month of entry 3,5,6	−0.236	0.789	0.126	−0.305	0.737	0.185
Month of entry 4						
Head of the household (o.t.h.)	−0.285	0.752	0.300	−0.789	0.454	0.046
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	−0.243	0.784	0.580	−1.145	0.318	0.039
No family relationship to the head o.t.h.	−0.332	0.717	0.469	−0.462	0.630	0.476
# of persons in the household [0-3)	−0.171	0.843	0.602	0.870	2.387	0.037
# of persons in the household [3-12)	−0.224	0.799	0.125	−0.524	0.592	0.007
Local unemployment rate - quarter of entry	−0.007	0.993	0.667	0.002	1.002	0.937
Walloon region						
Flemish region	−0.397	0.673	0.222	−0.480	0.619	0.311
Brussels region	0.277	1.319	0.199	0.731	2.078	0.023
Employment to non-employment						

Table 3: Estimation results - men (continued)

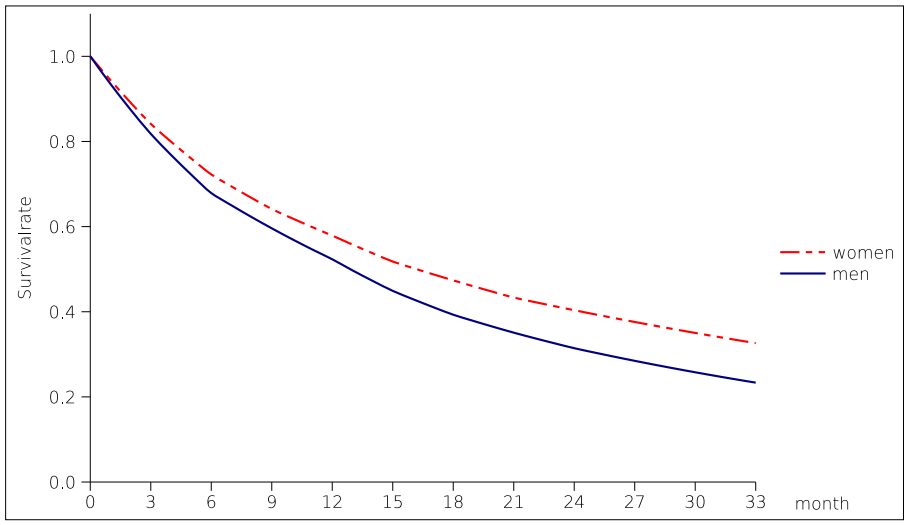
	no UH			with UH		
men	**b**	**exp(b)**	**p-value**	**b**	**exp(b)**	**p-value**
Age - mean(age)	−0.029	0.971	0.085	−0.034	0.967	0.122
Belgian						
EU not Belgian	0.116	1.123	0.237	0.104	1.110	0.440
Not EU	0.096	1.101	0.389	0.148	1.160	0.344
Primary school	0.628	1.874	0.000	0.899	2.456	0.000
Lower secondary school	0.321	1.379	0.000	0.451	1.569	0.000
Higher secondary school						
College - non-university	−0.197	0.821	0.044	−0.273	0.761	0.025
College - university	−0.274	0.760	0.033	−0.355	0.701	0.024
Other education	−0.314	0.731	0.238	−0.272	0.762	0.426
Unknown education	−1.343	0.261	0.000	−1.690	0.185	0.000
Month of entry 1,2,7,8,9,10,11,12	0.139	1.149	0.033	0.179	1.196	0.036
Month of entry 3,5,6	0.031	1.031	0.600	0.028	1.029	0.712
Month of entry 4						
Head of the household (o.t.h.)	0.322	1.380	0.000	0.368	1.445	0.003
Son/daughter of the head o.t.h.						
Other family relationship to the head o.t.h.	0.063	1.065	0.660	0.083	1.087	0.662
No family relationship to the head o.t.h.	−0.088	0.915	0.549	−0.134	0.875	0.486
# of persons in the household [0-3)	0.059	1.061	0.628	0.145	1.156	0.395
# of persons in the household [3-12)	0.006	1.006	0.895	0.014	1.014	0.829
Local unemployment rate – quarter of entry	0.001	1.001	0.864	0.007	1.007	0.420
Walloon region						
Flemish region	0.136	1.145	0.193	0.118	1.125	0.396
Brussels region	−0.037	0.964	0.656	−0.078	0.925	0.482
Manufacture of food products and beverages	−0.268	0.765	0.225	−0.465	0.628	0.097
Construction	−0.747	0.474	0.000	−0.999	0.368	0.000
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goo	−0.231	0.794	0.068	−0.401	0.670	0.016
Hotels and restaurants	−0.392	0.676	0.001	−0.527	0.590	0.001
Other business activities						
Public administration and defence; compulsory social security	−0.778	0.460	0.000	−1.061	0.346	0.000
Education	−0.072	0.930	0.668	−0.141	0.868	0.515
Health and social work	−0.732	0.481	0.000	−0.990	0.371	0.000
Agriculture, hunting and forestry	0.132	1.141	0.371	0.146	1.157	0.461
Manufacturing, Recycling	−0.521	0.594	0.000	−0.757	0.469	0.000
Electricity, gas and water supply	−0.767	0.464	0.012	−1.145	0.318	0.002
Wholesale and sale; repair of motor vehicles, motorcycles and personal and household goods	−0.499	0.607	0.001	−0.709	0.492	0.000
Transport, storage and communication	−0.903	0.405	0.000	−1.210	0.298	0.000
Financial intermediation	−0.748	0.473	0.003	−1.121	0.326	0.000
Real estate, renting and business activities	−0.975	0.377	0.000	−1.341	0.261	0.000
Other community, social and personal service activities	−0.317	0.728	0.022	−0.492	0.611	0.006
Mining+Activities of households as employers of domestic staff+Badly defined activities	−0.928	0.395	0.007	−1.180	0.307	0.004
APL	−0.184	0.832	0.284	−0.280	0.756	0.171
Self-employed	−0.391	0.676	0.437	−0.571	0.565	0.396
Size	−0.076	0.927	0.123	−0.102	0.903	0.109
Sizeˆ2	0.006	1.006	0.190	0.007	1.007	0.202
ln(unemployment-duration)	−0.004	0.996	0.889	−0.073	0.930	0.415
Participation 1st year	−0.453	0.636	0.000	−0.665	0.515	0.336
Participation 2nd year	0.321	1.378	0.222	−0.251	0.778	0.780
After participation	0.291	1.337	0.166	0.007	1.007	0.993
BASELINE HAZARD						
Unemployment to regular employment						

Table 3: Estimation results - men (continued)

men	no UH b	no UH exp(b)	no UH p-value	with UH b	with UH exp(b)	with UH p-value
Constant						
Quarter 2	−0.146	0.865	0.016	−0.047	0.954	0.551
Quarter 3,4	−0.417	0.659	0.000	−0.243	0.784	0.019
Quarter 5,6	−0.253	0.776	0.000	0.018	1.018	0.903
Quarter 7,8	−0.383	0.682	0.000	−0.023	0.977	0.902
Quarter 9,10,11	−0.478	0.620	0.000	−0.040	0.961	0.849
Unemployment to subsidized employment						
Quarter 1						
Constant						
Quarter 3,4	−0.521	0.594	0.003	−0.126	0.882	0.535
Quarter 5	0.020	1.020	0.917	0.944	2.571	0.003
Quarter 6,7,8,9,10,11	−1.824	0.161	0.000	−0.494	0.610	0.316
Employment to non-employment						
Constant						
Quarter 2	−0.313	0.731	0.000	−0.073	0.930	0.423
Quarter 3,4	−0.685	0.504	0.000	−0.246	0.782	0.049
Quarter 5,6,7,8,9,10	−1.490	0.225	0.000	−0.688	0.503	0.000
DISTRIBUTION - Unobserved heterogeneity						
Points of support						
Unemployment to regular employment 1	−2.474	0.084	0.000	−1.746	0.175	0.000
Unemployment to regular employment 2				−2.982	0.051	0.000
Unemployment to subsidized employment 1	−4.259	0.014	0.000	−1.935	0.144	0.001
Unemployment to subsidized employment 2				-inf		
Employment to non-employment 1	−0.894	0.409	0.000	−0.036	0.965	0.910
Employment to non-employment 2				−1.650	0.192	0.000
Probability parameters: lam_rpn						
lam_111				−4.218	0.015	0.946
lam_112				-inf		
lam_121				−0.072	0.930	0.979
lam_122				1.661	5.263	0.574
lam_211				−0.298	0.743	0.919
lam_212				−0.298	0.743	0.916
lam_221				2.106	8.213	0.472
Probabilities: P_rpn						
P_111				0.001		
P_112				0.000		
P_121				0.055		
P_122				0.311		
P_211				0.044		
P_212				0.044		
P_221				0.486		
P_222				0.059		
Correlation of UH-terms						
corr(rp)				−0.231		
corr(rb)				−0.670		
corr(pb)				−0.051		

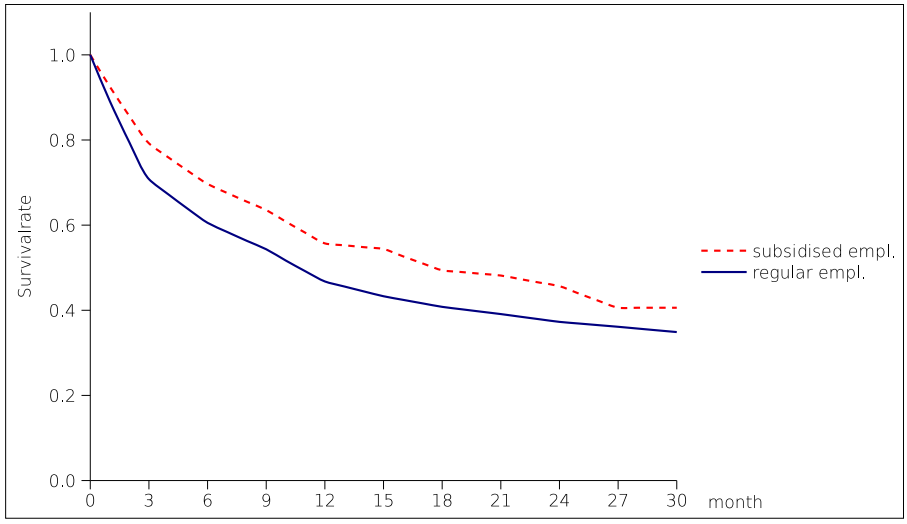
C Figures

Figure 1: Nonparametric survival rate for unemployment



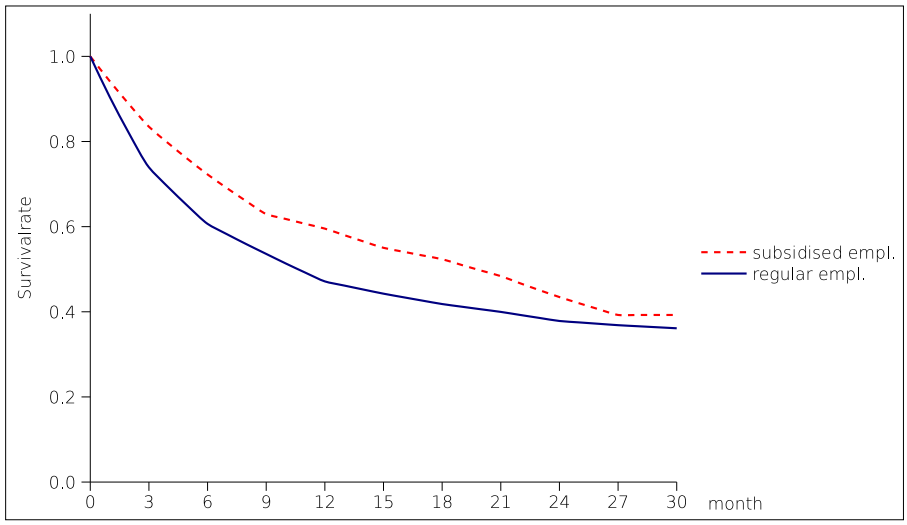
Note: Time is measured from the month of inflow into paid-unemployment.

Figure 2: Nonparametric survival rate for employment - female



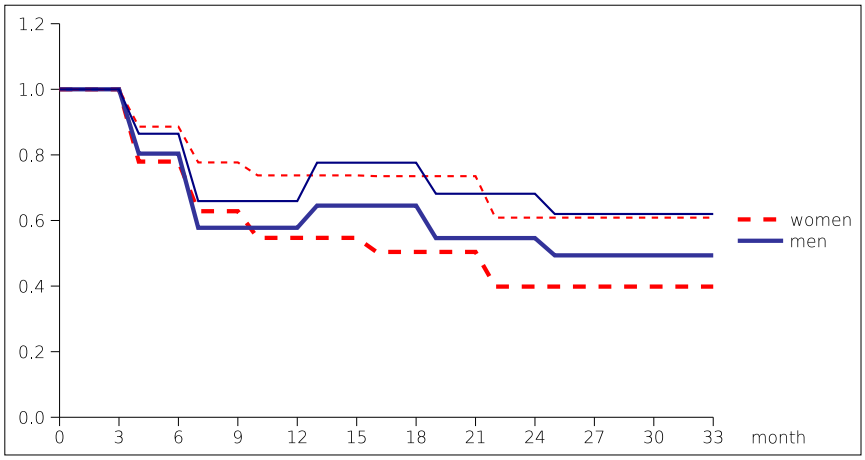
Note: The time is measured after the quarter of the transition to employment.

Figure 3: Nonparametric survival rate for employment - male



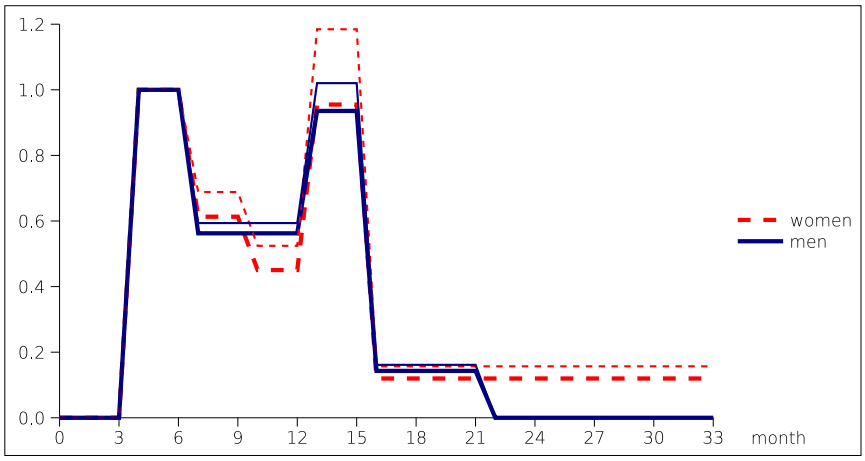
Note: The time is measured after the quarter of the transition to employment.

Figure 4: Time dependence: transition from unemployment to regular employment



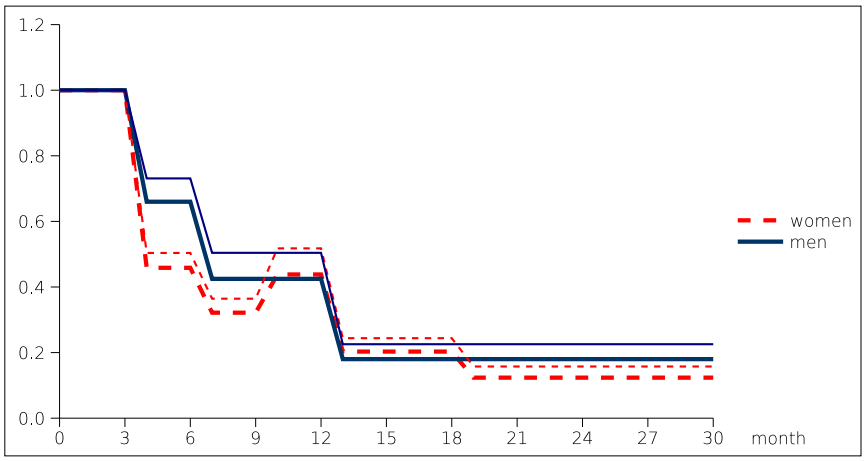
Note: Broad lines are used for transition rates without controlling for observed characteristics. Narrow lines are used transition rates when controlling for observed characteristics.
The transition rate for the first three months has been normalised to one for the purpose of exposition.
The time is measured from the month of entry into paid-unemployment.

Figure 5: Time dependence: transition from unemployment to subsidised employment



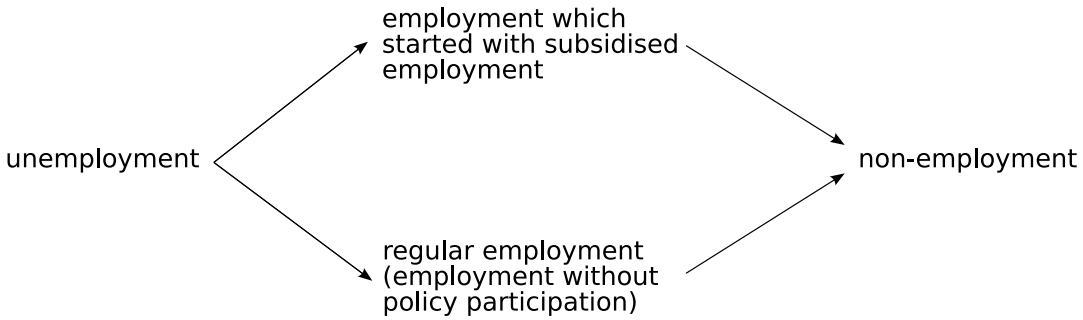
Note: Broad lines are used for transition rates without controlling for observed characteristics. Narrow lines are used transition rates when controlling for observed characteristics.
The transition rate for the first three months has been normalised to one for the purpose of exposition.
The time is measured from the month of entry into paid-unemployment.

Figure 6: Time dependence: transition from employment to non-employment



Note: Broad lines are used for transition rates without controlling for observed characteristics. Narrow lines are used transition rates when controlling for observed characteristics.
The transition rate for the first three months has been normalised to one for the purpose of exposition.
The time is measured after the quarter of the transition to employment.

Figure 7: Possible transitions in the model



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